

Small (J.W.)

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With the History of Twenty-six Cases
Where it has been Used.

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*Read in the Section of the Practice of Medicine and Physiology, at the
Forty-second Annual Meeting of the American Medical Association,
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Reprinted from "The Journal of the American Medical
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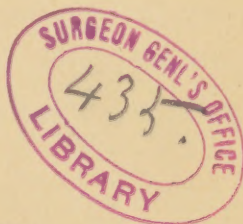
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THE THERAPEUTIC ACTION OF TONICA
WATER. WITH THE HISTORY OF
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HAS BEEN USED.

Water, as an agent in the treatment of disease, is a remedy which should not be too lightly estimated, as it is more or less concerned in all those changes which take place in inorganic matter, and is essential to the life and growth of all living organisms, whether animal or vegetable. When taken into the stomach it acts by its temperature, its bulk, its absorption, and as a solvent for mineral and vegetable matters which otherwise could produce no beneficial action in the animal economy. When natural spring waters are so far impregnated with foreign substances as to have a decided taste and a peculiar therapeutic action, they are classed in the Pharmacopœia as mineral waters, and are divided into five classes: the carbonated, alkaline, sulphuretted, saline (including magnesian, chalybeate and chlorinated), and silicious. The name of each of these classes

suggests its peculiar impregnation; but analysis of the water of nearly all mineral springs shows a combination of the ingredients of two or more of these classes, and some, like the one I describe, the whole of them.

The Tonica mineral water is an alkaline, carbonated, sulphuretted, silicious, chalybeate water which comes from the earth in its natural purity at Highland Park, Conn., ten miles from Hartford, on the N. Y. and N. E. R. R. Its analysis, made at the Massachusetts Institute of Technology, shows it to contain to the U. S. gallon :

Sulphate of potassium	0.355	gr.
Carbonate of potassium	0.180	"
Chloride of sodium	0.215	"
Carbonate of sodium	0.345	"
Carbonate of lime.	0.512	"
Carbonate of magnesia	0.234	"
Bicarbonate of iron.	0.970	"
Phosphoric acid	0.051	"
Silica	0.618	"
Alumina	0.093	"
Oxide of manganese	a trace.	
Sulphuretted hydrogen	a trace.	
Organic and volatile matter	0.510	gr.

Making a total of 4.083 grs.

This water also contains carbonic acid gas in solution.

It will be seen from this analysis that the ingredient which enters most largely into its composition is bicarbonate of iron, of which each gallon contains 0.970 gr.; the next is silica, 0.618 gr.; and the third carbonate of lime, 0.512 gr. It also contains 0.051 gr. of phosphoric acid, a trace of oxide of manganese, sulphate and car-

bonate of potassium, and chloride and carbonate of sodium.

Therapeutic Action.—This water is not an active cathartic, but rather a mild aperient. By the stomach and bowels it is easily retained, absorbed and assimilated. It does not constipate the bowels, as do many of the waters which contain iron, and does not produce or increase acidity, being alkaline in its reaction. If taken in large quantity it will produce free catharsis at first, but its cathartic action diminishes with its use. It is at all times an active but gentle diuretic, increasing the frequency of micturition and the amount of urine excreted by the kidneys. It increases the appetite, promotes digestion, and gives a feeling of warmth, tonicity and buoyancy to the whole system. It has a slightly sulphurous, earthy but not unpleasant taste, and is readily taken by the most fastidious. But its most valuable therapeutic action is upon the blood, upon which it exerts all the beneficial effects of an iron tonic, without any of those disagreeable results which attend and follow the continued administration of iron in other forms. In all conditions of the system characterized by a depraved condition of the blood, as constitutional syphilis, scrofula, chronic albuminuria, phthisis, anæmia and chlorosis, its revivifying action is soon apparent in the increasing bright, healthy color which it brings to the lips and cheeks, and its favorable action upon the appetite and digestion.

Mode of Administration.—In commencing the

use of this water I have usually begun with a pint each day in divided doses taken before, during, or directly after meals, two or three times per day, and increased the amount gradually to one quart, and then diminished the quantity per day if the necessities of the case seemed to so require. In diabetic cases I usually commence with a quart or three pints and gradually diminish. If a quart is taken the first day it is usually followed by a free cathartic action of the bowels and free diuresis. But if a smaller quantity be taken at first and the amount gradually increased, only a gentle stimulation of the bowels and kidneys is perceived, and the same beneficial results are attained. In cases where wine is indicated, I give the wine with three or four times its quantity of the water, making a very pleasant and agreeable beverage. Upon my own table I always use it in this manner. It is also a very agreeable vehicle for bitter tinctures or infusions.

During the last year I have been enabled to make an extended use of this water in a large variety of chronic cases of disease, and also upon myself personally. In connection with three other physicians I have noted its use in about sixty cases. Only a few can be described in a paper like this, but I have selected twenty-six cases in which its use has been attended with the best results, and present their history herewith.

Case 1.—Chronic parenchymatous nephritis, cystitis and prostatitis. Mr. J. F. C., age 62 years. Contracted syphilis five years ago. Two

years ago had syphilitic orchitis, resulting in sarcoma of right testicle, which was removed by a surgeon. When he came under my observation he was suffering from chronic parenchymatous nephritis, the amount of albumen in his urine being very large and containing fatty and hyaline casts. Also had chronic cystitis and catarrh of the bladder. Prostate gland very much enlarged and micturition impossible without the use of the catheter. Acute syphilitic orchitis of left testicle, which was enormously swollen. After the inflammatory symptoms had subsided I gave him Tonic water, directing him to drink an ordinary quart bottle full each day. At first it produced free catharsis and increased considerably the amount of urine excreted by the kidneys. At the end of one month marked improvement was visible, with albumen reduced one-half. At the end of two months albumen about one-fourth, and after three months one-eighth the original amount. Appetite and digestion improved from the first, so that instead of being confined to the house, he is now performing all the duties of an active business life. This patient had been unable to take any of the ordinary forms of iron on account of their constipating and irritating effects upon the bowels.

Case 2.—Obesity, gout and rheumatism. Mr. E. F., a clerk and a man of sedentary and indolent habits, age 50. Height 5 ft. 5 in., weight at commencement of treatment 220 lbs. Chest contained a large amount of fat, which materially

weakened the action of the heart. Considerable dyspnœa upon slight exertion, as upon going up a long flight of stairs. Specific gravity of urine 1010, and contained considerable albumen. After some preliminary treatment, I gave Tonica water in doses of one pint each day, with meals, gradually increasing the amount to one quart each day and keeping it at the latter amount for one month, then gradually decreasing. At the end of one month all symptoms of gout and rheumatism were gone and albumen had disappeared from his urine. Weight reduced 10 lbs. Appetite and digestion were much improved and abnormal heart symptoms had disappeared. At the end of three months had lost 10 lbs. more in weight. It is now five months since I first ordered Tonica for this patient, and he has lost about 25 lbs. of flesh, while his general condition has improved very much. The only change I made in his diet was to order him to abstain from saccharine and amy-laceous foods, tea and coffee, partake of but one course at a meal, and have plenty of exercise in the open air.

Case 3.—Obesity and membranous dysmenorrhœa. Mrs. E. B., housewife, age 45, height 5 ft. 4 in., weight 226 lbs. Heart sounds weak and somewhat irregular, and great dyspnœa upon active exertion. Symptoms of fatty degeneration of muscular tissue of heart. Had suffered for two years from membranous dysmenorrhœa, the pain each month being intense and continuing from two to three days, and passage of membrane

followed by very excessive menstrual flow. Gave a pint of Tonica each day, with injections into the uterus of sol. ac. carb. and tr. iodine once a week during the intermenstrual period, commencing first injection two days after cessation of menses. Regulated diet and exercise as in the preceding case. The result, after three months' treatment, has been a loss of 20 lbs. in weight, with complete cure of dysmenorrhœa. Condition of blood and general system very much improved.

Case 4.—Anæmia, chronic bronchitis and asthma. Mrs. J. W., age 42, housekeeper, has suffered several years from chronic catarrh of nose and throat, chronic bronchitis, anæmia and asthma. Applied local treatment to nose and throat and gave one pint Tonica each day for three months. At the end of that time the condition of this patient was very much better; catarrh and bronchitis wholly gone and no more attacks of asthma. Improvement in quality of blood very noticeable. I had previously given her iron in the form of a tincture and also a syrup of the albuminate, and combined with quinine and strychnine, but the effects were not lasting, as these seem to be.

Case 5.—Diabetes mellitus. Mr. E. R., age 40, engineer, had suffered for two years with gradual loss of weight, intense thirst and increased appetite. Former weight 180 lbs.; weight at beginning of treatment with Tonica 145 lbs. Amount of sugar in urine 13 grs. to oz. Specific gravity of urine 1042. I had previously limited

this patient to a strict anti-diabetic diet and tried all the usual diabetic remedies, with the effect of reducing the specific gravity of the urine to 1037 and the amount of sugar somewhat, but not materially arresting the disease. In December, 1890, I commenced giving him Tonica water, giving him three pints each day and no other liquid, but continuing the anti diabetic diet. At the end of January, 1891, I found the amount of sugar in the urine reduced to 5 grs. per oz. and specific gravity 1031, with marked diminution of thirst and appetite. March 3, I found the amount of sugar reduced to 3 grs. per oz., specific gravity 1029, with a gain in flesh of 10 lbs. At the present time (April 20, 1891), there is only a trace of sugar in the urine, its specific gravity is reduced to 1021; weight of patient is increased to 165 lbs.

Case 6.—Hypertrophy and valvular lesions of heart. Mr. R. W., 55 years old, shoe manufacturer, has taken a pint of Tonica each day for two months, with general improvement of blood and circulation, and disappearance of cardiac murmurs.

Case 7.—Anæmia and neurasthenia following "la grippe." Mr. J. R., artist, age 42, had a very severe attack of epidemic influenza, which was followed by general nervous weakness and anæmia. Gave one pint Tonica each day for two months. At the end of that time I find patient's general condition greatly improved, appetite and digestion good, and no remains of the malady apparent.

Case 8.—Anæmia and intercostal neuralgia. Mrs. E. F. J., age 43. Three years ago had two severe hæmorrhages from left lung. Has suffered since from anæmia with periodical attacks of intercostal neuralgia, these attacks occurring at intervals of a month or six weeks. Gave Tonica water, a pint each day for three months, with the effect of materially increasing the red corpuscles of the blood and improving the appetite and digestion. It has been now five months since I first gave this treatment, and for the last three months she has had no neuralgia.

Case 9.—Amenorrhœa, chlorosis. Emma B., age 16, had never menstruated, but had attacks of periodical headaches, recurring each month; is anæmic and poorly developed, skin yellow, complains of weakness and difficulty of breathing upon slight exertion, and shows symptoms of hypertrophy of heart. Gave one pint Tonica each day for three months, and ordered her to take plenty of exercise in the open air, with good nourishing diet, which soon established the menstrual flow, built up the blood and regulated the action of the heart and circulation.

Case 10.—Chronic dyspepsia, chronic constipation, acute rheumatism. Mrs. S. L., age 56, housewife, has had acid dyspepsia with troublesome flatulency for years, with occasional attacks of acute rheumatism. Is pale, anæmic, poorly nourished, and bowels constipated. Gave Tonica each day for three months, with disappearance of dyspeptic and rheumatic symptoms and general

improvement of blood and digestion. Action of bowels, after once established, remains good.

In a paper written by R. M. Griswold, M.D., of Portland, Conn., a physician who lives in the vicinity of the springs and has had large opportunities for testing the medicinal qualities of the water, and entitled, "The Medicinal Use of Highland Tonica Water in various diseases, but especially in Dyspepsia and Diabetes Mellitus," I find a very interesting history of its use in thirteen cases, of which five were cases of chronic dyspepsia complicated with malaria and anæmia, one of acute malarial fever with acute gastritis, one of chronic cystitis, one of chronic eczema in a child 5 years old, and five cases of diabetes mellitus. Dr. Griswold claims such good results from the use of this water in these cases, and the history of the five cases of diabetes mellitus is so very interesting, that with his permission I have copied them from his valuable paper. Dr. Griswold says:

I will now notice five cases of diabetes mellitus treated with Tonica water after all other means of treatment had ailed. In three of these cases the disease had not been even arrested by treatment. In the other two it had at times apparently been arrested, but there was no permanent improvement. Three of them, before coming under my observation, had been limited to the most approved anti-diabetic diet; the others had not been so strictly dieted. In all five cases the diagnosis was not to be doubted, as sugar in large amount was found in the urine repeatedly, both by physicians who had previously treated them, by myself, and by two experts in urinary analysis. The treatment in all these cases was similar, and consisted first, of a strictly anti-diabetic diet as follows: plain soups, oysters, clams, beef, poultry, bacon and ham, all kinds of vegetables except potatoes, turnips, carrots, parsnips, peas, beans and tomatoes. Cheese, butter, unsweetened

custards, buttermilk, dry and sour wines, as claret and sherry, acid fruits, as lemons, currants, etc. Tea, cream, coffee without sugar, gluten bread from flour made by Farwell & Rhines, of Watertown, N. Y. In each case everything of a saccharine or farinaceous nature was carefully excluded, also all malt or spirituous liquors except the wines mentioned, and no water other than *Tonica* allowed. But it should be remembered that in three of these cases the diet had before been as carefully regulated, but with no apparent benefit.

Case 1.—Quarryman, 35 years old, Swede. Weighed when in health 190 lbs., present weight 130 lbs. Has been able to do no work for five months. Passes from 4 to 6 quarts of urine per day. Excessive thirst, markedly increased appetite. Pains in back, arms and legs, constant headache. Sugar 14 grs. to the oz., spec. gr. 1042. This case came under my observation in July, 1888. He was put upon red sulph. arsenic gr. 1-50 after meals, and limited to three pints of *Tonica* water per day for drink. At the end of one month a second examination of the urine showed sugar 5 grs. to the oz., sp. gr. 1032. In three months the amount of sugar was the same and the sp. gr. had not decreased, but there was a marked diminution of thirst and desire for food, a slight gain in flesh, and improvement in the general condition. In five months the sugar had decreased to 2 grs. to the oz. and the sp. gr. to 1028, and there was a gain of 8 lbs. in flesh. From this time on the improvement was steady, and the gain in weight correspondingly so, and in April of the next year he resumed his work, when no sugar could be detected in his urine, although the sp. gr. still was above normal—1025. He had gained 25 lbs. in flesh and was apparently well. He remained under my observation until the autumn of 1890, when he returned to Sweden, at that time weighing 170 lbs.

Case 2, in nearly every respect similar to *Case 1*, came under observation in September, 1888. Previous weight when in health 160 lbs., present weight 128 lbs. Amount of sugar in urine not noted, sp. gr. 1042. Treatment the same as in previous case. At the end of six months, sugar 3 grs. to the oz., sp. gr. 1031, gain in flesh 8 lbs. August, 1889, sugar $\frac{1}{2}$ gr., sp. gr. 1028, gain in weight 13 lbs. Since that time I have examined the urine at intervals of about three months. At each examination traces of sugar are found, and the sp. gr. remains a little above normal, 1022 to 1026, but he feels well and maintains his present weight of about 150 lbs.

Case 3.—Quarryman, Swede, age 52. Previous weight 180 lbs., present weight 140 lbs. Not able to work for seven months. Came under observation January, 1890. Treatment as in previous cases. At time of first observation was passing 80 ozs. of urine per day. Sugar 20 grs. per oz., sp. gr. 1041. At last observation, January, 1891, he had gained 24 lbs. in flesh, sugar 3 grs. to oz., sp. gr. 1028. He is working every day and feels well.

Case 4.—Banker, aged 54. Had diabetes for six years. First seen in February, 1890. Weight seven years ago 192 lbs., present weight 142 lbs. No note of amount of sugar, sp. gr. 1038. Treatment as in previous cases. One year from date, weight 165 lbs., sugar none, sp. gr. 1021.

Case 5.—Merchant, age 47. Disease first diagnosed two years before. Came under observation March, 1890. Weight 124 lbs., previous weight 174 lbs. Sugar 14 grs. to oz., sp. gr. 1037. June, 1890, sugar 11 grs. to oz., sp. gr. 1031. September, 1890, sugar 4 grs. to oz., sp. gr. 1025, gain in weight 24 lbs.

Cases 3, 4 and 5 are still under observation. They are now, and have been for more than a year, using from one to three pints of Tonica water per day. In each case the arsenic was discontinued in from three to six months from the commencement of its use. The anti-diabetic diet is continued, but in each case I attribute the much more than usually favorable results to the Tonica water, as in each, but more especially in three of the cases, the same treatment had been faithfully followed for periods of from six months to six years, but without the Tonica, and in none of them had there been any improvement, and in all but two the disease was progressing rapidly to an apparently fatal termination.

My friend, Dr. Jas. T. Tibbetts, of Hyde Park, Mass., has sent me the history of two cases of gout and rheumatism and one of chronic cystitis, in which he has used Tonica water very successfully, but for the sake of brevity I will omit the details.

At this date it does not require any argument to convince the medical profession of the utility and value of iron as a nutrient tonic for the blood. Of its peculiar action in anæmia Stillé says: "The

red blood discs appear to be the organ to which iron is especially directed, and by which the activity of animal life as well as of organic life is sustained at the highest point. These bodies it is which by contact with the inspired air in the lungs attract and become impregnated with oxygen, the essential agent in all the compositions and decompositions which sustain life in the tissues, acquiring thereby the scarlet hue of arterial blood, which they lose with their oxygen in their passage through the tissues to the venous system. Thus it would appear that the activity of nutrition, and probably also of calorification, is dependent upon the iron in the blood; and that when the red blood discs which contain it are most abundant, all of the functions of the economy attain their highest degree of activity and vigor." And in his theory of the operation of iron he says: "Iron, on entering the blood-vessels, combines immediately with the discs which have not yet acquired or have lost more or less of their ferruginous element. It enters the blood as a chloride, is decomposed, combines with the discs as a carbonate of the protoxide of iron, and in the lungs gives up carbonic acid and absorbs oxygen, and is thereby converted into a peroxide. The white corpuscles are destitute of iron, but when once saturated with it neither they nor the red corpuscles can receive any more."

But in order to obtain in the system the effects of iron as a specific nutrient tonic it is necessary, in persons of a bilious temperament or those suf-

fering from stomach or intestinal indigestion, or torpidity of the kidneys, to gently stimulate these organs, thereby increasing their activity and their powers of absorption, assimilation and excretion, as, without a healthy action of these organs, most preparations of iron prove inert and act as a clog upon the system; and also to present the iron to the system in an exceedingly soluble condition, so that it may be easily absorbed and assimilated by the stomach and bowels.

Judging from my own experience with this water, it meets both these requirements more perfectly than any other ferruginous preparation which I have ever found, and for that reason is a most valuable adjuvant to other remedies in the treatment of:

1. Anæmia, amenorrhœa and chlorosis.
2. All menstrual derangements attended with periodical hæmorrhages.
3. In organic disease of the heart.
4. In nervous affections complicated with anæmia, as neuralgia, chorea, etc.
5. In depraved conditions of the blood, as constitutional syphilis, chronic albuminuria, and scrofula with anæmia.
6. In phthisis, chronic bronchitis and chronic catarrh.
7. As an alterative and nutrient tonic after eruptive fevers, as measles, scarlet fever, and in the anæmia following epidemic influenza.
8. In chronic malarial poisoning.
9. In errors of malassimilation and malnutrition, as diabetes mellitus, obesity, etc.
10. In chronic constipation complicated with acid dyspepsia and anæmia.

